



# “That one makes things small”: Experimentally induced spontaneous memories in 3.5-year-olds



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## ABSTRACT

We introduce a new method for examining spontaneous (unprompted) autobiographical memories in 3.5-year-old children, by inducing them in a laboratory setting. Thirty-eight 3.5-year-olds, who had previously participated in a study in our lab involving highly unique props, were brought back after a one-month delay to the same lab arranged as in the original study and with the same Experimenter present. While waiting for the Experimenter in front of the props, their spontaneous verbalizations about the previous unique experiment were recorded, scored, and compared to those of 29 naïve Controls of the same age. The children in the experimental group produced significantly more spontaneous verbalizations related to the to-be-remembered event measured on a variety of dimensions. The study introduces a promising new approach to investigating spontaneous memories in young children in a controlled lab setting. The findings are discussed in relation to involuntary autobiographical memories as examined in adults.

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## 1. Introduction

Many parents have experienced incidents in which their young children spontaneously have recalled memories where the memory apparently just came to the child's mind without any deliberate attempt to recall. The following excerpt from Nelson and Ross' (1980) diary study serves as an illustrative example:

[...] a toddler who had moved away from his old neighborhood before being able to say the name of a friend who had lived down the block, clearly yelled the friend's name “Ar-wen-da, Ar-wen-da” (Arlen there) when she passed the house one and a half months later. (p. 96)

In the adult memory literature past events that come to mind with no preceding attempts at retrieval are called *involuntary autobiographical memories* (Berntsen, 1996). Recently there has been an upsurge of studies on involuntary memories in adults (Berntsen, 2009, for a review). It has been claimed that involuntary memories constitute a basic mode of remembering that is universal and at least as frequent in daily life as voluntary autobiographical memories – that is, memories retrieved through a deliberate and goal directed retrieval strategy (Berntsen, 2010, 2012). Involuntary autobiographical memories appear to require less executive control and to be highly dependent on associative mechanisms. As a consequence it has been proposed that such memories are less cognitively demanding and therefore presumably present earlier in life than memories retrieved in a strategic and goal-directed fashion (Berntsen, 2012; see also Todd & Perlmutter, 1980).

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However, systematic research on the issue from a developmental perspective is virtually non-existent, and as a consequence surprisingly little is known about involuntary autobiographical memories in early childhood.<sup>1</sup> The absence of systematic research on the topic from a developmental perspective may, at least in part, be due to methodological obstacles when attempting to study involuntary memories in children. When examining involuntary memories in adults, participants are typically asked to record such memories when they come to mind for example by using a structured diary or an electronic recording device. In order to accomplish this task, they are being carefully instructed and provided with illustrative examples of involuntary memories (e.g., [Berntsen, 1996, 2009](#)). However, when considering preschool children, such instructions would not work, because young children do not possess the meta-cognitive abilities required to understand them and to monitor the recording of the memories.

In order to circumvent this methodological problem, in the present study we have chosen to employ a term that does not imply advanced meta-cognitive abilities on the children's side. Thus, we are interested in children's *spontaneous memories*, which we define as *verbally produced, environmentally cued, and unprompted memories*. Spontaneous memories as defined here, therefore (a) will have to be *verbally produced* in order to avoid speculations concerning whether the memories are explicit or not; (b) will have to be *environmentally cued* as is typically the case in adult examples of involuntary memories ([Berntsen, 2009](#)); and importantly (c) will have to be *unprompted*, that is, not occur as a result of prompts of any kind as for instance, explicit or implicit questions directed at the child, or direct or indirect demand characteristics exerted on the child. Whether spontaneous memories as defined here qualify as involuntary memories in the 'adult' sense or not cannot be assessed with certainty. We return to this possibility in the discussion.

As will be made clear in the following literature review on 'spontaneous' memories in young children, no one has hitherto examined young children's spontaneous (unprompted) memories by controlled means. In the present study we attempt to provide the first step in order to remedy this gap in the research literature by introducing a new method for investigating spontaneous memories in young children in a controlled laboratory setting.

### 1.1. Naturalistic studies of everyday memory in young children

A number of studies ([Ashmead & Perlmutter, 1980](#); [Hudson, 1990](#); [Nelson, 1989](#); [Nelson & Ross, 1980](#); [Reese, 1999](#); [Todd & Perlmutter, 1980](#)) have used unstructured or semi-structured methodologies, usually diary studies, to examine the characteristics of memory and remembering early in life when observed in naturalistic settings. Although such studies were not designed to capture spontaneous memories exclusively they have often identified spontaneous memory reports as an important category of memory records.

For instance, [Nelson and Ross \(1980\)](#) conducted a structured diary study with 19 children (six 21-month-olds, six 24-month-olds, and seven 27-month-olds) over a three-month period based on carefully written instructions to the mothers to report their child's memories, defined as both recognition and recall of a variety of material. As has been the case with research on adult involuntary memories (e.g., see [Berntsen, 2009](#), for a review) they found that the great majority of spontaneous memory reports appeared to have been triggered by cues in the environment and that external, physical cues were especially dominant ([Nelson & Ross, 1980](#)).

Another specific example of a spontaneous memory comes from the diary study by [Todd and Perlmutter \(1980, p. 82\)](#), who referred to a two-year-old who, while looking at a picture of Santa Claus, suddenly referred verbally to an episode that (according to his parents) took place nine months earlier when he had put Sesame Street ornaments on the Christmas tree.

Likewise, as part of a prospective study [Reese \(1999\)](#) asked 58 mothers to record their children's spontaneous talk about their past, when the children were 25 and 32 months old, respectively. The reports were classified according to whether they were simple associations, events, or language based (verbal statements that had been part of events). The cues were classified according to whether they were physical (belonged to the external environment), verbal, or internal. Reese found that the frequency of memory reports referring to events increased from 25 to 32 months, and that physical cues were considerably more frequent than other cues across both times. She also found that the memories were typically about mundane positive events ([Reese, 1999](#)). Such dominance of mundane and positive events triggered by external cues is consistent with what has been found in diary studies of involuntary autobiographical memories in adults, although here the dominance of external cues is less pronounced ([Berntsen, 2009](#)). Some of the key findings from these studies show that children do indeed have spontaneous memories as defined here, that is, verbally produced, environmentally cued, and unprompted. Note further, that these findings correspond quite well with findings on involuntary memories in adults studied through a structured diary methodology. Such similarities support the idea that the former actually may reflect a precursor for adult involuntary episodic remembering.

Diary studies like the ones cited above excel in having high ecological validity ([Todd & Perlmutter, 1980](#)), and they provide evidence that spontaneous memories are present in the lives of many children. However, diary studies have their own weaknesses (e.g., [Nelson & Ross, 1980](#)). In most cases diary studies imply potential problems with accuracy and errors in reporting. Furthermore, their validity relies on the parents' ability and willingness to comply with the instructions provided by the researchers ([Nelson & Ross, 1980](#)). Finally, children live different lives and therefore remember different episodes,

<sup>1</sup> It should be noted that some studies ([Dufresne & Kobasigawa, 1989](#); [Jones, Swift, & Johnson, 1988](#); [Newman, 1990](#); [Poddubnaya, 1981](#); [Smirnov & Shlychkova, 1977](#); [Sophian & Hagen, 1978](#)) have used the term involuntary (or non-deliberate) memories to refer to involuntary (or non-deliberate) *encoding* of a memory, and not involuntary *recall* as the term is used in the present context.

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